Air Quality Permitting
Statement of Basis

May 10, 2006

Tier II Operating Permit
No. T2-050126

Tri-Pro Cedar Products Incorporated, Oldtown

Facility ID No. 017-00006

Prepared by:

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AIR QUALITY DIVISION

FINAL

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Acronyms, Units, and Chemical Nomenclature

AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pound per hour
NAAQS	National Ambient Air Quality Standard
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O_3	ozone
PM	Particulate Matter
PM_{10}	Particulate Matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PTC	Permit to Construct
PTE	Potential to Emit
Rules	Rules for the Control of Air Pollution in Idaho
SIC	Standard Industrial Classification
SM	synthetic minor
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/yr	Tons per year
$\mu g/m^3$	micrograms per cubic meter
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.400 through 410 Rules for the Control of Air Pollution in Idaho (Rules) for issuing Tier II operating permits (Tier II).

2. FACILITY DESCRIPTION

Tri-Pro Cedar Products, Inc., operates a lumber mill that includes sawmill, dry kilns, planer mill, and associated equipment to process raw logs into dried dimensional lumber.

3. FACILITY / AREA CLASSIFICATION

Tri-Pro Cedar Products, Incorporated, (Tri-Pro) is classified as a synthetic minor facility. Tri-Pro's potential to emit is limited to less than major source thresholds. The AIRS classification is "SM".

The facility is located within AQCR 63 and UTM zone 11. The facility is located in Bonner County which is designated as unclassifiable for all regulated criteria pollutants (PM_{10}, CO, NO_X, SO_2, lead, and ozone).

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at Tri-Pro. This required information is entered into the EPA AIRs database.

4. APPLICATION SCOPE

Tri-Pro has submitted a Tier II application to remove the operating hours limitation for the process equipment cyclones. Modeling predicts that emissions from the cyclones will not cause or contribute to violation of the PM_{10} NAAQS on either a short-term or long-term basis. Removal of the restriction does not result in an increase of emissions because emissions are inherently limited by a throughput limit. No other changes were requested.

4.1 Application Chronology

November 18, 2005	Application received
November 21, 2005	Application inactivated due to resource constraints
January 11, 2006	Application activated
January 31, 2006	DEQ declared the application complete
March 30, 2006	DEQ issued the facility a draft permit for review
March 30, 2006	Draft permit was provided to DEQ's Coeur d'Alene Regional Office for review
May 2, 2006	DEQ receive a fax from Steve Linton of Tri-Pro that stated "The permit can be issued as is"
May 8, 2006	DEQ received an e-mail from the Coeur d'Alene Regional office that stated, "No comments on this permit"

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this Tier II.

This permitting action removes the operational hours restriction for the process equipment cyclones. Removal of this condition does not cause or contribute to a violation of the PM_{10} NAAQS (short-term or long-term) and does not change the facility's synthetic minor status.

5.1 Equipment Listing

This permit revision does not change the equipment list of the Tier II operating permit issued September 5, 2003. No new equipment or equipment change was involved in this revision.

5.2 Emissions Inventory

This permit revision for removing the operating hours on the cyclones would initially suggest an increase in emissions. However, the limited throughput of 90 million board feet of dimensional lumber inherently limits the hours of cyclone operation. The emissions of the cyclones in the Tier II operating permit issued September 5, 2003, were calculated at the maximum hourly rate. Therefore, the actual annual emissions of the cyclones will be no greater if the lumber were processed with a 16-hour day or a 24-hour day. The 16-hour a day limitation was requested and modeled in the Tier II application prepared by the facility and received June 14, 2002, by DEQ.

A review of the August 26, 2003, Statement of Basis indicates the cyclones would have qualified for 24-hour per day operations when the original permit was written if requested and modeled at that time. This revision requested an increase to 20 operational hours a day for the cyclones. The review of this request, and the original modeling indicates the cyclones hourly emissions were calculated at the maximum emission rate. The increase to 24-hour a day operation of the cyclones with the permitted restriction of the facility's throughput for 90 million board-feet of lumber annually does not exceed the 24-hour for the NAAQS of 150 ug/m^3. The total potential emissions stays below any major thresholds thus allows the facility to maintain a synthetic minor classification. Therefore, the restrictions on the cyclones' operation were removed from this permit. The detailed emissions inventory is located in Appendix B.

5.3 Modeling

The modeled PM_{10} impact of the change in the cyclone's operational hours was reviewed by DEQ staff. The unlimited hours of cyclone operation does not allow an exceedance of the 24-hour PM_{10} for the NAAQS. The cyclone's emissions in the Tier II permit issued September 5, 2003, were determined at the maximum hourly emission rate. The original modeling was performed for a 16 hours per day operation at the request of the facility. The original impact of the cyclones was increased to demonstrate the PM_{10} impact of 24 hours per day operation. Adding the 24 hours per day operational impact to the impact of other permit limited facility emissions and to the background indicates the total impact is below the 150 ug/m^3 24 hour PM_{10} for the NAAQS.

The PM_{10} for Tri-Pro at 24 hours per day is estimated as follows:

The impact of other facility sources is 4 ug/m^3. The impact of the cyclones at 16 hours per day operation is 38.8 ug/m^3. Multiplying the 38.8 ug/m^3 by the ratio of 24/16 yields the 24 hours per day operation impact. The present statewide background concentration for PM_{10} is 73 ug/m^3.

$$4.0\ ug/m^3 + (38.8\ ug/m^3 \times (24\ hr/\ 16\ hr)) + 73\ ug/m^3 = 135\ ug/m^3$$

Therefore, the cyclones are allowed to operate 24 hours per day.

The copy of the modeling analysis for the September 5, 2003, issued Tier II operating permit is located in Appendix C of this statement of basis.

5.4 *Regulatory Review*

IDAPA 58.01.01.404.04 Permit Revision or Renewal

Tri-Pro proposes to remove an operational requirement from its existing Tier II operating permit. The revision does not result in an increase in emissions because emissions are inherently limited by another operational requirement (throughput limit). Because emissions do not increase, a public comment period is not required.

5.5 *Fee Review*

A Tier II operating permit processing fee of $500 is required for this permit revision in accordance with IDAPA 58.01.01.407. The removal of the cyclones within this revision does not cause an increase in any annual emissions.

5.6 *Regional Review of Draft Permit*

The draft permit was sent to the Coeur d'Alene Regional Office on March 30, 2006. The e-mail from Coeur d'Alene Regional office of May 8, 2006, stated "no comments on this permit."

5.7 *Facility Review of Draft Permit*

A draft permit was provided for facility review on March 30, 2006. The fax from Steve Linton of Tri-Pro Cedar Products on May 3, 2006, stated "the permit can be issued as is."

6. PERMIT CONDITIONS

The removal of the previously permitted cyclones is the only change from the Tier II operating Permit issued September 5, 2003.

7. PUBLIC COMMENT

In accordance with IDAPA 58.01.01.404.01.c, a public comment period on the proposed Tier II operating permit and application materials is not required for revised permits for which there is not an emissions increase.

8. RECOMMENDATION

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends that DEQ issue final Tier II Operating Permit No. T2-050126 to Tri Pro Cedar Products, Inc.

REB/bf Permit No. T2-050126

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Appendix A

AIRS Information

T2-050126

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

Facility Name: Tri-Pro Cedar Products, Incorporated
Facility Location: Oldtown, Idaho 83822
AIRS Number: 017-00006

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO_2	B							U
NO_x	B							U
CO	B							U
PM_{10}	SM						SM	U
PT (Particulate)	SM							U
VOC	B						SM	U
THAP (Total HAPs)								
			APPLICABLE SUBPART					

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

Appendix B

Emissions Inventory

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Potential Emissions Inventory

Source Description	PM_{10}		NO_x		CO		VOC		SO_2		Methanol		Formaldehyde	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Propane-Fired Boiler	0.03	0.15	1.20	5.27	0.16	0.72	0.03	0.11	0.04	0.16				
Debarking	0.34	1.49												
Bark Hog	0.58	2.55												
Sawmill	0.06	0.27												
Sawmill Screen	0.02	0.09												
Sawmill Chipper	0.08	0.35												
Lumber Dry Kilns	0.285	0.86					22.50	67.5			0.24	1.04	0.01	0.05
Planer Hog	0.25	1.08												
Planer Chipper Screen	0.01	0.03												
Fuel Bin (Cyclone #1)	1.29	5.65												
Bark (Cyclone #12)	1.93	8.45												
Shavings Bin (Cyclone # 2)	2.38 [b]	10.24 [b]												
Planer Shavings (Cyclone #3)	2.99	13.09												
Trimmer Bin (Cyclone #4)	2.70	11.82												
Planer Chipper (Cyclone #5)	1.03	4.51												
Shavings Bin (Cyclone #7)	0.93 [b]	4.07 [b]												
Fuel Bin Hog Fuel Storage Loading	1.69	7.40												
Fuel Bin Hog Fuel Storage Loadout	1.05	4.59												
Sawdust Bin Loading	1.40	6.14												
Sawdust Bin Truck Loadout	0.87	3.81												
Chip Bin Loading with Target Box	0.05	0.23												
Chip Bin Loadout	1.45	6.35												
Planer Chipper (Cyclone Direct Loadout to Trucks %5)	0.44	1.94												
Shavings Truck Bins Loading	1.32	5.80												
Shavings Truck Bins Loadout	0.41	1.8												
Mobile Sources Fugitive Dust – Unpaved	0.08	0.33												
Mobile Sources Fugitive Dust – Paved	0.06	0.26												

Table title: **Tri-Pro Cedar Products, Oldtown** — **Potential Emissions[a] – Hourly (lb/hr), and Annual (T/yr)**

[a] As determined by a pollutant-specific U.S. EPA reference method, a DEQ-approved alternative, or as determined by the DEQ's emissions estimation methods used in this permit analysis.

[b] #2 Cyclone and #7 Cyclone do not operate at the same time; they are used alternately.

[c] Emissions from Fuel Bin Shavings loadout are included in the Shavings Truck Bins loadout and Fuel Bin Hog Fuel Storage loadout.

Actual Emissions Inventory

Tri-Pro Cedar Products, Oldtown Potential Emissions[a] – Hourly (lb/hr), and Annual (T/yr)														
Source Description	PM_{10}		NO_x		CO		VOC		SO_2		Methanol		Formaldehyde	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Propane-Fired Boiler	0.03	0.15	1.20	5.27	0.16	0.72	0.03	0.11	0.04	0.16				
Debarking	0.34	1.49												
Bark Hog	0.58	2.55												
Sawmill	0.06	0.27												
Sawmill Screen	0.02	0.09												
Sawmill Chipper	0.08	0.35												
Lumber Dry Kilns	0.285	0.86					22.50	67.5			0.24	1.04	0.01	0.05
Planer Hog	0.25	1.08												
Planer Chipper Screen	0.01	0.03												
Fuel Bin (Cyclone #1)	1.29	3.75												
Bark (Cyclone #12)	1.93	5.63												
Shavings Bin (Cyclone # 2)	2.38[b]	6.95[b]												
Planer Shavings (Cyclone #3)	2.99	8.74												
Trimmer Bin (Cyclone #4)	2.70	7.88												
Planer Chipper (Cyclone #5)	1.03	3.0												
Shavings Bin (Cyclone #7)	0.93[b]	2.7[b]												
Fuel Bin Hog Fuel Storage Loading	1.69	7.4												
Fuel Bin Hog Fuel Storage Loadout	1.05	4.59												
Sawdust Bin Loading	1.40	6.14												
Sawdust Bin Truck Loadout	0.87	3.81												
Chip Bin Loading with Target Box	0.05	0.23												
Chip Bin Loadout	1.45	6.35												
Planer Chipper (Cyclone Direct Loadout to Trucks %5)	0.44	1.94												
Shavings Truck Bins Loading	1.32	5.8												
Shavings Truck Bins Loadout	0.41	1.8												
Mobile Sources Fugitive Dust – Unpaved	0.08	0.33												
Mobile Sources Fugitive Dust – Paved	0.06	0.26												

[a] As determined by a pollutant-specific U.S. EPA reference method, a DEQ-approved alternative, or as determined by the DEQ's emissions estimation methods used in this permit analysis.

[b] #2 Cyclone and #7 Cyclone do not operate at the same time; they are used alternately.

[c] Emissions from Fuel Bin Shavings loadout are included in the Shavings Truck Bins loadout and Fuel Bin Hog Fuel Storage loadout.

Appendix C

Modeling Review

T2-050126

MEMORANDUM

TO: Shawnee Chen, Engineer Technical I, State Office of Technical Services
Mary Anderson, Air Modeling Coordinator, Air Program Division

FROM: Kevin Schilling, Air Quality Scientist, State Office of Technical Services

SUBJECT: Modeling review for Tri-Pro Cedar Products, Inc., Tier II application; Oldtown, Idaho, facility

DATE: March 1, 2003

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1. SUMMARY:

Tri-Pro Cedar Products, Inc. (Tri-Pro) submitted a Tier II operating permit application for their Sawmill and Planing Mill located in Oldtown, Idaho. Atmospheric dispersion modeling of facility-wide emissions were submitted with the Tier II operating permit application to demonstrate that emissions from the facility would not cause or significantly contribute to a violation of an ambient air quality standard, as required by IDAPA 58.01.01.403.02.

2. DISCUSSION:

This section describes the regulatory modeling requirements and the methodology used for the analyses performed.

2.1 Introduction and Regulatory Requirements for Modeling

A review of atmospheric dispersion modeling of the Tri-Pro facility was conducted in support of issuing a Tier II operating permit for operations at their facility located at Oldtown, Idaho. Tri-Pro received a modified Permit to Construct (PTC) on December 17, 2001. The modified PTC added permit conditions to cease operations of hogged fuel-fired boilers, to formally limit facility's annual maximum lumber production of 90 million board feet, and to add a 7.87 MMBtu/hr propane-fired boiler. With this modified PTC, the facility became a synthetic minor facility and was not required to obtain a Tier I operating permit. Atmospheric dispersion modeling analyses were not conducted in support of the modified PTC. However, Tri-Pro was required by the modified PTC to submit a Tier II operating permit application to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) within six months of the PTC issuance.

On July 24, 2002, DEQ received a Tier II operating permit application from Lorenzen Engineering, Inc. (Lorenzen), Tri-Pro's consultant. Additional information was received by DEQ on June 14, 2002, July 24, 2002, August 6, 2002, December 5, 2002, December 16, 2002, December 17, 2002, December 18, 2002, and January 2, 2002. Tri-Pro stated in their July 24, 2002 submittal that they would permanently discontinue operation of the Olivine Woodwaste Incinerator and had closed exhaust of DEQ #6 Trimmer Cyclone. The Tier II operating permit and modeling analyses will address these changes and to keep the facility in a synthetic minor status.

No Tier II operating permit can be granted, per IDAPA 58.01.01.403.02, unless the applicant demonstrates to the satisfaction of DEQ that emissions from the facility "would not cause or significantly contribute to a violation of any ambient air quality standard." Atmospheric dispersion modeling was performed by Lorenzen to fulfill these requirements. No other modeling related requirements were identified for this Tier II operating permit.

2.2 Applicable Air Quality Impact Limits and Analyses

2.2.1 Area Classification

Tri-Pro is located in Bonner County, designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). There is no Class I area within 10 kilometers of the facility.

2.2.2 Significant Impact and Full Impact Analyses

If estimated maximum impacts to ambient air from the emissions sources at the facility exceed the "significant contribution" levels of IDAPA 58.01.01.006.93, then a full impact analysis is necessary per DEQ modeling guidance. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 1. Table 1 also lists significant contribution levels and specifies the modeled value that must be used for comparison to the NAAQS.

Table 1. Applicable Regulatory Limits

Pollutant	Averaging Period	Significant Contribution Level[a] (µg/m³)[b]	Regulatory Limit[c] (µg/m³)	Modeled Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
	Annual	1.0	50[h]	Maximum 1st highest[g]
Carbon monoxide (CO)	1-hour	2,000	40,000[f]	Maximum 2nd highest[g]
	8-hour	500	10,000[f]	Maximum 2nd highest[g]
Sulfur dioxide (SO_2)	3-hour	25	1,300[f]	Maximum 2nd highest[g]
	24-hour	5	365[f]	Maximum 2nd highest[g]
	Annual	1.0	80[h]	Maximum 1st highest[g]
Nitrogen dioxide (NO_2)	Annual	1.0	100[h]	Maximum 1st highest[g]
Lead (Pb)	Quarterly	NA	1.5[h]	Maximum 1st highest[g]

a. IDAPA 58.01.01.006.93
b. Micrograms per cubic meter
c. IDAPA 58.01.01.577
d. When using five years of meteorological data
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
f. Not to be exceeded more than once per year
g. Concentration at any modeled receptor using five years of meteorological data
h. Not to be exceeded

2.2.3 Toxic Air Pollutant Impact Analysis

An ambient air assessment of Toxic Air Pollutant (TAP) impacts was not necessary, per the DEQ Air Program Division, for the facility to demonstrate compliance with IDAPA 58.01.01.161.

2.3 Background Concentrations

DEQ provided Lorenzen with background concentration values in July 2002. These were based on a refined assessment of applicable background concentration values, conducted by DEQ State Office of Technical Services (Technical Services), for numerous areas in Idaho. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Table 2 lists these revised background concentrations. Some concentrations in Table 2 are slightly lower than values provided to Lorenzen because of minor refinements made in the DEQ assessment since July 2002.

Table 2. Background Concentrations

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	81
	Annual	26
Carbon monoxide (CO)	1-hour	10,200
	8-hour	3,400
Sulfur dioxide (SO_2)	3-hour	42
	24-hour	26
	Annual	8
Nitrogen dioxide (NO_2)	Annual	32
Lead (Pb)	Quarterly	0.03

a. Micrograms per cubic meter
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

2.4 Modeling Impact Assessment

Table 3 provides a summary of the modeling parameters used for the DEQ analyses.

Table 3. Modeling Parameters

Parameter	Description/Values	Documentation/Additional Description
Model	ISCST3	Version 02035
Meteorological data	Surface and Upper Air Spokane, Washington	1987-1991: Flow vectors rotated by – 45 degrees to reflect the valley alignment
Model options	Regulatory Default	
Land use	Rural	Low population density in area and large fraction of unimproved land
Terrain	7.5 min DEM	Receptor elevations automatically extracted from DEM by BEEST software
Building downwash	Used building profile input program for ISCST3 (BPIP)	Building dimensions obtained from modeling files submitted
Receptor grids (See Figure 1)	Grid 1	25 meter spacing along site boundary out to 100 meters
	Grid 2	50 meter spacing out to about 500 meters
	Grid 3	100 meter spacing out to about 2,000 meters
	Grid 4	500 meter spacing out to about 6,800 meters
Facility location (UTM)[a]	Easting	496 kilometers
	Northing	5,336 kilometers

a. Universal Transverse Mercator

2.4.1 Modeling Protocol

A modeling protocol was submitted to DEQ on October 4, 2002. Discussions pertaining to dispersion modeling issues occurred between DEQ and Lorenzen prior to the December 2002 submittal.

2.4.2 Model Selection

The initial ambient air impact analyses were performed by Lorenzen, Tri-Pro's consultant, using the model ISCST3. The facility layout was reviewed by DEQ to evaluate the potential need for calculating concentrations within building recirculation cavities. Building/source pairs near the facility's ambient air boundary were further evaluated, using SCREEN3, to determine whether specific source plumes

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could be entrained in recirculation cavities and to calculate the downwind length of recirculation cavities. This analysis is presented in Attachment A of this memorandum and indicates that ambient air receptors are located beyond the recirculation cavities of buildings present at the facility.

2.4.3 Meteorological Data

Surface and upper air meteorological data from Spokane, Washington, for 1987 through 1991, were used in the modeling analyses. Lorenzen rotated the wind flow vectors by –45 degrees to better account for the valley orientation in the Oldtown area as compared to the Spokane, Washington, airport. This approach was discussed with DEQ prior to the application submittal. DEQ State Office of Technical Services (Technical Services) determined that these data, with the stated modifications, were the most representative data available for the area.

2.4.4 Terrain Effects

The modeling analyses submitted by Lorenzen considered elevated terrain. Source, building, and receptor elevations were regenerated for the DEQ verification modeling using USGS 7.5 minute Digital Elevation Model (DEM) files. The following DEM files were used in the analyses:

- 4811688.DEM, Priest River, Idaho
- 4811781.DEM, Newport, Washington

The Priest River DEM was obtained from the WebMET.com website at http://www.webmet.com. The Newport DEM was obtained from Lorenzen, since it was not available from the WebMET.com site and only the 1 degree DEM was available through internal DEQ resources. Lorenzen indicated the Newport DEM was originally obtained from a USGS-affiliated site titled MapMart.

2.4.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to a facility plot plan submitted with the application and aerial photographs of the area. Figure 1 shows the emission sources, buildings, and receptors included in the dispersion modeling analysis.

2.4.6 Building Downwash Effects

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program for ISCST3 (BPIP) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters. DEQ verification modeling was conducted using regenerated parameters from BPIP.

2.4.7 Ambient Air Boudary

The boundary to ambient air was determined in the application by methods described in the *Idaho Modeling Guideline*. A combination of fences and the Pend Oreille River comprise the boundary to ambient air. The ambient air boundary can be observed in Figure 2.

2.4.8 Receptors

Modeling submitted by Lorenzen utilized the following receptor grid: 25 meter spacing along the facility fenceline; 100 meter spacing out to a distance of about 2,000 meters from the facility boundary; 500 meter spacing out to a distance of about 7,000 meters. A second modeling run, using a receptor density of 10 meters, was conducted by Lorenzen for an area exhibiting the highest ambient concentrations. DEQ verification modeling was conducted using the following DEQ-generated grid of ambient air receptors: 25 meter spacing out to 100 meters from the fenceline; 50

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meter spacing out to about 200 meters; 100 meter spacing out to about 2,000 meters; 500 meter spacing out to about 6,800 meters. A receptor grid extending out to about 7,000 meters was used to ensure that emissions from the 30 ft stack, under stable atmospheric conditions, would not cause high pollutant concentrations at distant receptors located on elevated terrain.

2.4.9 Emissions Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application and the proposed permit. The following approach was used for DEQ verification modeling:

- All modeled emissions rates were equal to or slightly greater than the facility's emissions calculated in the Tier II operating permit application or the permitted allowable rate.
- Modeling results were compared to "significant contribution" thresholds. More extensive review of modeling parameters selected was conducted when model results approached applicable thresholds.

Table 4 provides emissions quantities for criteria pollutants.

Table 4. Criteria Pollutant Emissions Rates Used for Modeling

Source (Id Code)	Hourly Rate Used for Modeling (lb/hr)[a]			
Pollutant	PM_{10} [b]	CO [c]	SO_2 [d]	NO_x [e]
Boiler (PBOILER)	0.03	0.16	0.01	1.29
Lumber Drying Kiln, 2 horizontal outlets (KILNN, KILNS)	0.14[f]	—	—	—
DEQ #1 Fuel Bin Cyclone (DEQ#1)	0.8[illegible][f]	—	—	—
DEQ #2 Shavings Bin Cyclone (runs alternately with DEQ #7 Shavings Bin Cyclone) (DEQ#2)	1.8[illegible]	—	—	—
DEQ #3 Planer Shavings Cyclone (DEQ#3)	2.0[illegible]	—	—	—
DEQ #4 Trimmer Bin Cyclone (DEQ#4)	1.8[illegible]	—	—	—
DEQ #5 Planer Chipper Cyclone (DEQ#5)	0.8[illegible]	—	—	—
DEQ #6 Trimmer Cyclone (exhaust permanently capped)	0.8	—	—	—
DEQ #7 Shavings Bin Cyclone	Runs alternately with DEQ #2 Shavings Bin Cyclone. Not modeled.			
DEQ #12 Bark Cyclone (DEQ#12)	1.2[f]	—	—	—

a Pounds per hour
b Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
c Carbon monoxide
d Sulfur dioxide
e Oxides of nitrogen
f Emissions value differs from value in originally submitted application (see below)

Emissions of PM_{10}, NO_x, and CO from the propane-fired boiler were estimated based on emissions factors published in Table 1.5-1 of AP-42, Rev 10/96 and the boiler's design capacity, as explained in the DEQ Engineering Technical Memorandum. Modeling analyses submitted conservatively assumed 100% of NOx emissions were NO_2. SO_2 emissions estimates were provided by Lorenzen, based on Santa Barbara County Air Pollution Control District (SBAPCD) Engineering Division, application processing and calculations guidance for SO_x emission factors for gaseous fuel.

The PM_{10} and VOC emissions from the dehumidification lumber drying kilns were calculated using emissions factors from *Idaho DEQ Emission Factor Guide for Wood Industry* (rev.11/99), using a 90% control efficiency for PM_{10} emissions. The justification of 90% control efficiency was provided in Tri-Pro's December 16, 2002 submittal.

The standard cubic feet per minute (scfm) design air flow capacities, provided in Tri-Pro's Tier II operating permit application, were used to estimate PM_{10} emissions from the cyclones. PM_{10} emissions factors for the cyclones, in the form of grains per standard foot of flow, were obtained from the *Idaho DEQ emission factor Guide for Wood Industry* (rev.11/99). Daily allowable emissions were

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calculated by assuming maximum hourly rates for a daily maximum operational schedule of 16 hours per day.

Hourly modeled emissions from the cyclones were calculated by dividing the permitted daily emissions by 24. DEQ modified emissions rates in the model for some sources to maintain consistency with the proposed permit. The following describes those changes made to emissions rates used in the modeling:

- PM_{10} emissions of 20.6 lb/day (0.86 lb/hr for 24 hour emissions) were listed in the proposed DEQ permit for the DEQ #1 Cyclone, whereas an emissions rate of 0.89 lb/hr was modeled by Lorenzen.

- PM_{10} emissions of 30.9 lb/day (1.29 lb/hr for 24 hour emissions) were listed in the DEQ permit for the DEQ #12 Cyclone, whereas an emissions rate of 0.51 lb/hr was modeled by Lorenzen.

- PM_{10} emissions of 0.285 lb/hr (0.143 lb/hr for each of two vents) were listed in the DEQ permit for the drying kilns, whereas an emissions rate of 0.1 lb/hr for each vent was modeled by Lorenzen.

Fugitive emissions from a number of storage bin loading/unloading activities, debarking, hog operations, and other miscellaneous sawing were not included in the modeling analyses. Lorenzen indicated that these emissions are sporadic and can be effectively controlled through numerous implemented control measures, such as monitoring and control of visible emissions. DEQ Technical Services concurs that exclusion of these sources are appropriate if reasonable emissions controls are implemented and demonstrated by the facility.

2.4.8 Emissions Release Parameters

Table 5 provides emissions release parameters, including stack location, stack height, stack diameter, exhaust temperature, and exhaust velocity. The parameters used in the model were those provided in electronic modeling files submitted by Lorenzen, except as described below.

Table 5. Emissions and Stack Parameters

Source / Location	Source Type	Stack Height (m)[a]	Modeled Diameter (m)	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
PBOILER, 498315E, 5336403N	Point, rain-capped	9.14	3[d]	469	0.001
KILNN, 498263E, 5336455N	Point, horizontal	6.7	0.001[e]	294	0.001
KILNS, 498263E, 5336437N	Point, horizontal	6.7	0.001[e]	294	0.001
DEQ#1, 498150E, 5336502N	Point, horizontal	30.5	0.001[e]	[illegible]	0.001
DEQ#2, 498291E, 5336552N	Point, horizontal	22.9	0.001[e]	[illegible]	0.001
DEQ#3, 498380E, 5336503N	Point, horizontal	15.2	0.001[e]	[illegible]	0.001
DEQ#4, 498290E, 5336545N	Point, rain-capped	24.4	0.91	[illegible]	0.001
DEQ#8, 498298E, 5336562N	Point, horizontal	12.2	0.001[e]	[illegible]	0.001
DEQ#12, 498554E, 5336606N	Point, rain-capped	13.7	0.91	[illegible]	0.001

a Meters
b Kelvin
c Horizontal release set at 0.001 to eliminate momentum induced plume rise
d Diameter increased to account for thermal buoyancy while eliminating momentum induced plume rise with the 0.001 m/sec flow velocity
e Diameter set at 0.001 m to effectively eliminate stack tip downwash for horizontal releases

The boiler stack (PBOILER) flow velocity was set to 0.001 m/sec to eliminate momentum induced plume rise because of the presence of a rain cap. Thermal buoyancy should still be considered because of the elevated temperature of the stack gas. To properly account for thermal buoyancy in this instance, the stack diameter was increased to the point where the modeled stack volumetric flow was equal to the actual stack flow. Lorenzen initially used a Boiler stack flow of nearly 8,000 actual

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cubic feet per minute (acfm). A combustion evaluation, performed by DEQ based on the allowable fuel usage, indicated a flow of only about 2,400 acfm with 10% excess air. A stack diameter of 36 meters corresponds to a flow of 2,423 acfm when using a stack gas velocity of 0.001 m/sec. Lorenzen was advised of this modification and concurred with the DEQ-calculated flow rate.

3.0 MODELING RESULTS:

This Section describes dispersion modeling results from the significant impact analysis and the full impact analysis.

3.1 Significant Impact Analysis Results

Modeled ambient air impact results from the significant impact analysis are provided in Table 6 for facility-wide emissions. The applicant did not conduct a separate Significant Impact Analysis, but *modeled all pollutants in a full impact analysis. The values reported in this table were obtained from the applicant's submittal. Results from an independent review and verification analysis conducted by DEQ Technical Services are listed in parentheses. Differences between the two analyses are* attributable to changes in the emissions rates of some sources and the modification to the boiler diameter to more properly account for thermal buoyancy. Because the potential ambient impact of facility-wide emissions are greater than significant contribution levels for 24-hour and annual PM_{10} and annual NO_2, a full impact analysis was performed.

Table 6. Significant Impact Analysis for Criteria Pollutants

Pollutant	Averaging Period	Ambient Impact ($\mu g/m^3$)[a,b]	Significant Contribution[c] ($\mu g/m^3$)	Full Impact Analysis Required (Y or N)
PM_{10}[d]	24-hour	46.6[e] (63.2)	5.0	Y
	Annual	6.7 (8.2)	1.0	Y
Carbon monoxide (CO)	1-hour	25.7[e] (38.5)	2,000	N
	8-hour	9.6[e] (15.2)	500	N
Sulfur dioxide (SO_2)	3-hour	4.2[e] (6.8)	25	N
	24-hour	1.6[e] (2.3)	5	N
	Annual	0.17 (0.28)	1.0	N
Nitrogen dioxide (NO_2)	Annual	5.0 (8.3)	1.0	Y

a. Concentration in micrograms per cubic meter

b. *First values listed are impacts submitted by the applicant; values in parentheses are results* from DEQ verification modeling

c. *Significant contribution level as per IDAPA 58.01.01.006.93*

d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

e. Impacts submitted by the applicant for averaging periods of 24 hours and less are the maximum of modeled 2nd high results at each receptor

3.2 Full Impact Analysis Results

A full impact analysis for attainment area pollutants involves modeling facility-wide emissions and adding an appropriate background concentration value to those results. Results of the full impact analysis are presented in Table 7.

Modeled air pollutant concentrations in ambient air, including a conservative background concentration value, are all well below NAAQS. The maximum of 6th highest PM_{10} concentrations at all receptors for the 24-hour averaging period is 83% of the NAAQS. Table 8 shows the individual contributions of the boiler, kilns, and cyclones to modeled PM_{10} concentrations in ambient air. These *estimated group-specific impacts are from DEQ verification modeling results only.* PM_{10} impacts from the boiler are nearly negligible, with a maximum impact of less than 10% of that associated with either *the kilns or the cyclones. The maximum impact of the kilns, at 20 $\mu g/m^3$, is about half that associated* with the combined impact of 39 μg/m³ from the cyclones. The cyclones have a larger effect on ambient air because of their low temperature horizontal release and larger cumulative emissions rate. Figure 2 shows 6[th] highest 24-hour averaged modeled PM_{10} concentrations. The entire modeling domain is not shown in Figure 2.

Table 7. Full Impact Analysis for Criteria Pollutants (Facility-wide Emissions)

Pollutant	Averaging Period	Ambient Impact. (μg/m³)[a,b]	Background Conc. (μg/m³)	Total Ambient Conc. (μg/m³)	Regulatory Limit[c] (μg/m³)	Percent of NAAQS
PM_{10}[d]	24-hour	48.6[e] (42.8[f])	81 (81)	129.6 (123.8)	150	86 (83)
	Annual	6.7[g] (8.2[g])	27 (26)	33.7 (34.2)	50	67 (68)
Nitrogen dioxide (NO_2)	Annual	5.0[g] (8.3[g])	32 (32)	37.0 (40.3)	100	37 (40)

a. Concentration in micrograms per cubic meter
b. First values listed are impacts submitted by the applicant; values in parentheses are results from DEQ verification modeling
c. IDAPA 58.01.01.577
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
e. Impact modeled by Lorenzen (impacts for averaging periods of 24 hours and less are the modeled maximum of 2[nd] high results at each receptor)
f. Maximum 6[th] highest modeled value at any receptor
g. Maximum 1[st] highest modeled value at any receptor

Table 8. Source-Specific PM_{10}[a] Contributions

Source	Averaging Period	Ambient Impact. (μg/m³)[b]	Background Conc. (μg/m³)	Total Ambient Conc. (μg/m³)	Regulatory Limit[c] (μg/m³)	Percent of NAAQS
Boiler	24-hour	1.3[d]	81	82.3	150	55
	Annual	0.21[e]	26	26.2	50	52
Kilns	24-hour	20.1[d]	81	101.1	150	67
	Annual	3.7[e]	26	29.7	50	59
Cyclones	24-hour	38.8[d]	81	119.8	150	80
	Annual	7.8[e]	26	33.8	50	68

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
b. Concentration in micrograms per cubic meter
c. IDAPA 58.01.01.577
d. Maximum 6[th] highest modeled value at any receptor
e. Maximum 1[st] highest modeled value at any receptor

3.3 TAP Analysis Results

No TAP modeling analysis was conducted for this Tier II operating permit.

4.0 CONCLUSION

There were slight differences between modeling results submitted by Lorenzen and those obtained from DEQ verification analyses. These differences were primarily caused by differences in emissions rates for the kilns and cyclones and the flow parameters used to model the boiler. The emissions rates used in the DEQ verification modeling were those used in the proposed permit. Differences between the two analyses do not result in any differences in analysis applicability evaluations or overall conclusions.

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All modeling results of criteria pollutants are well below NAAQS. Process fugitives were not included in the dispersion modeling analyses. However, if these sources are reasonably controlled it is estimated that impacts to ambient air would be negligible.

Electronic copies of the modeling analysis are saved on disk. Table 9 provides a summary of the files used in the modeling analysis. The permitting engineer has reviewed this modeling memo to ensure consistency with the Tier II operating permit and technical memorandum.

Table 9. Dispersion Modeling Files

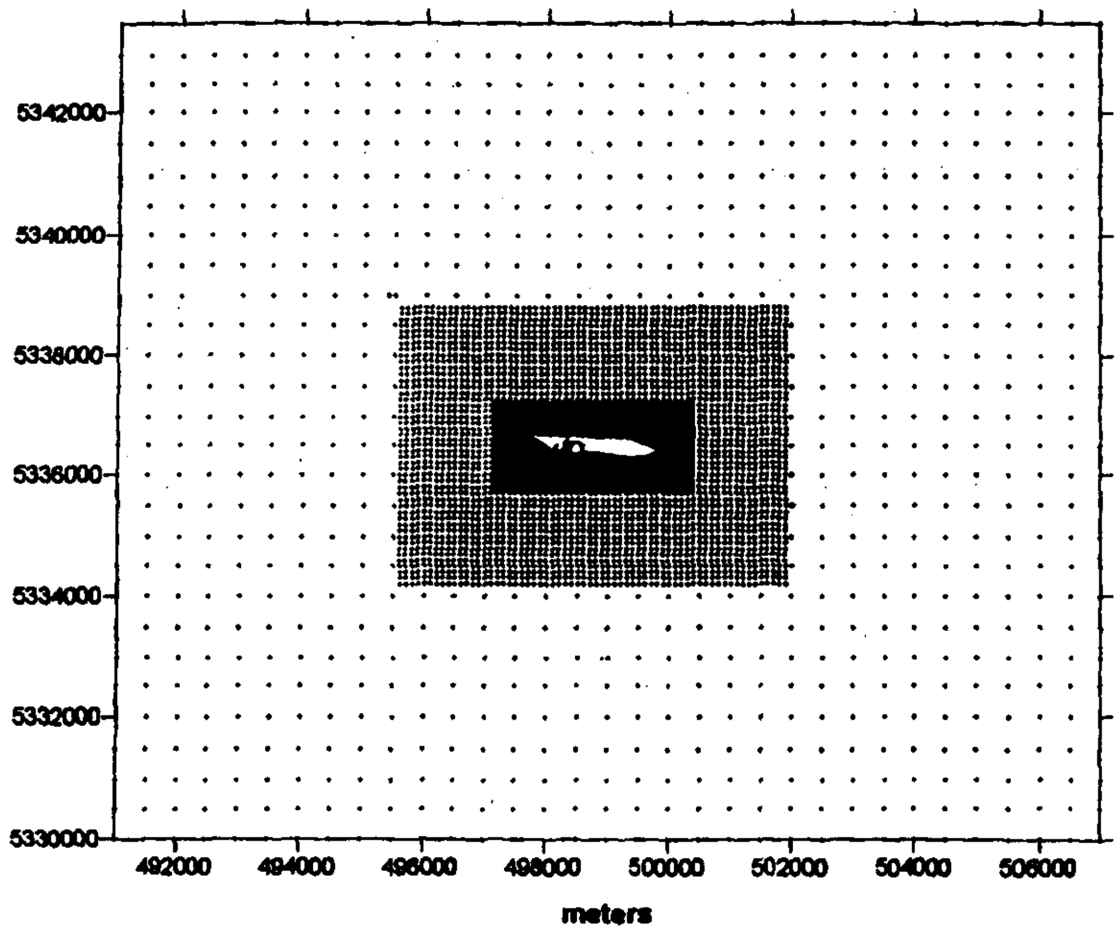
Type of File	Description	File Name
Met data	Surface and upper air from Spokane, Washington NWS data: January 1987 – December 1991	SpkXX.ASC (rural mixing heights adjusted)
BEEST input files	24-hour PM_{10}, SO_2, CO	TriPro24hour.BST
	Annual PM_{10}, NO_2, SO_2	TriProXXAnn.BST XX = year of met data
Each BST file has the following type of files associated with it:		
	Input file for BPIP program	.PIP
	BPIP output file	.TAB
	Concise BPIP output file	.SUM
	BEE-Line file containing direction specific building dimensions	.SO
	ISCST3 input file for each pollutant	.DTA
	ISCST3 output list file for each pollutant	.LST
	User summary output file for each pollutant	.USF
	Master graphics output file for each pollutant	.GRF
Some modeling files have the following type of graphics files associated with them:		
	Surfer data file	.DAT
	Surfer boundary file	.BLN
	Surfer post file containing source locations	.TXT
	Surfer plot file	.SRF

KS: G:\TECHNICAL SERVICES\MODELING\SCHILLING\TRIPRO\TRIPRO MODELING TECH MEMO.DOC

9

Figure 1 - Tri-Pro Tier II Operating Permit Modeling Review

Facility Layout, Emissions Sources, and Ambient Receptors

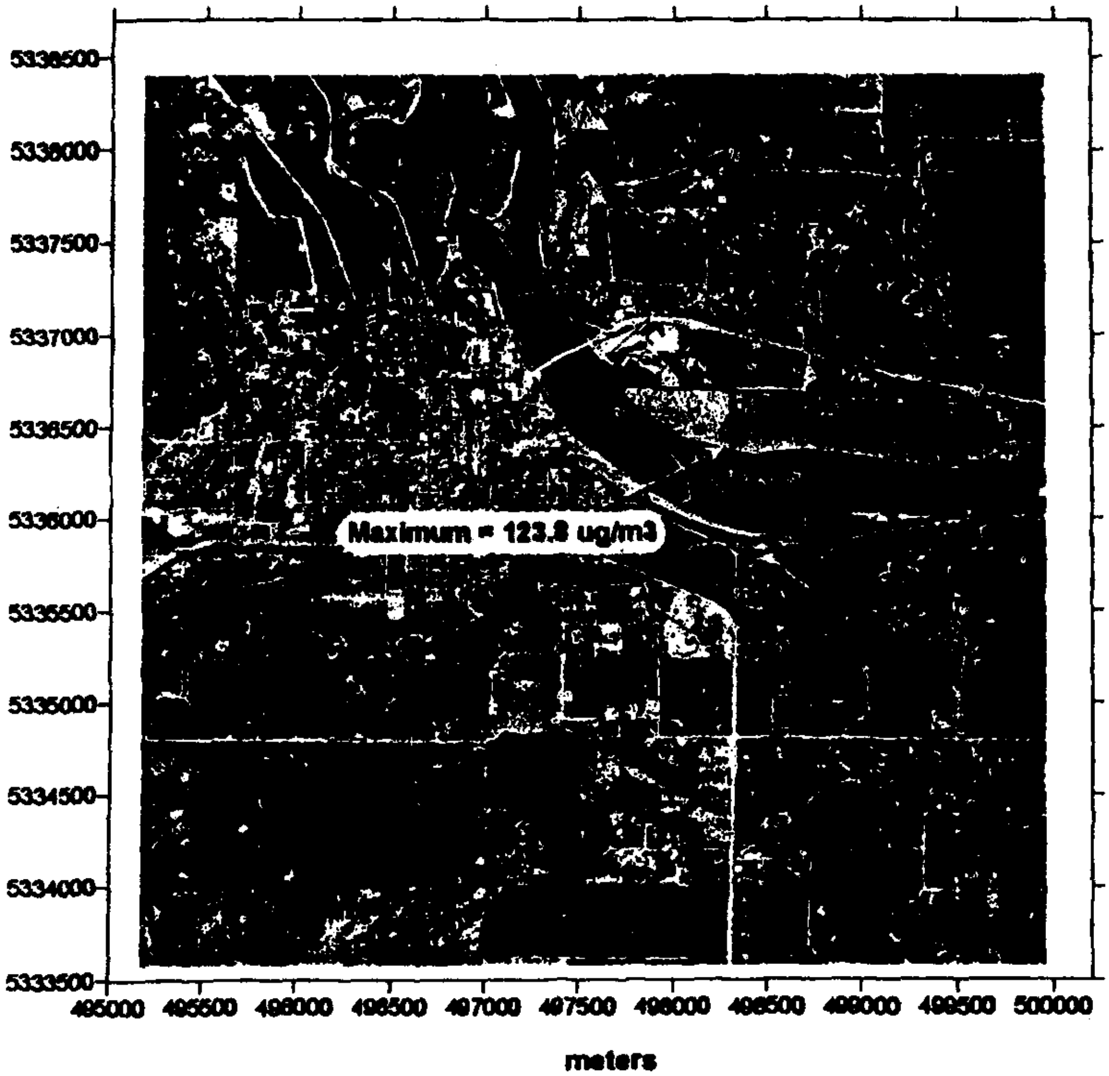


10

Figure 2 - Tri-Pro Tier II Operating Permit Modeling Review

Contours of 6th Highest 24-Hour Averaged PM10 Concentrations

Includes 81 ug/m3 Background Concentration



Idaho Department of Environmental Quality
Office of Technical Services

CALCULATION SHEET

Sheet 1 of 1

Project: Tri-Pro Tier II   Work Order: ______   File No. ______

Title of Calculation: Modeling Review   Prepared By: K. Schilling   Date: 3/20/03

Item: Building downwash cavity calc.   Checked By: ______   Date: ______

Cavity Assessment Kilns Bldg

building height = 6.706 m
max. projected width = 3.8 cm (34.6 m/cm) = 131.5 m
min projected width = 2.0 cm (34.6 m/cm) = 69.2 m
stack height = 6.706 m (source = KILNS)
stack temp = 294 K
velocity = 0.001 m
diameter = 0.001 m

From Screen3, maximum cavity distance = 39 m.

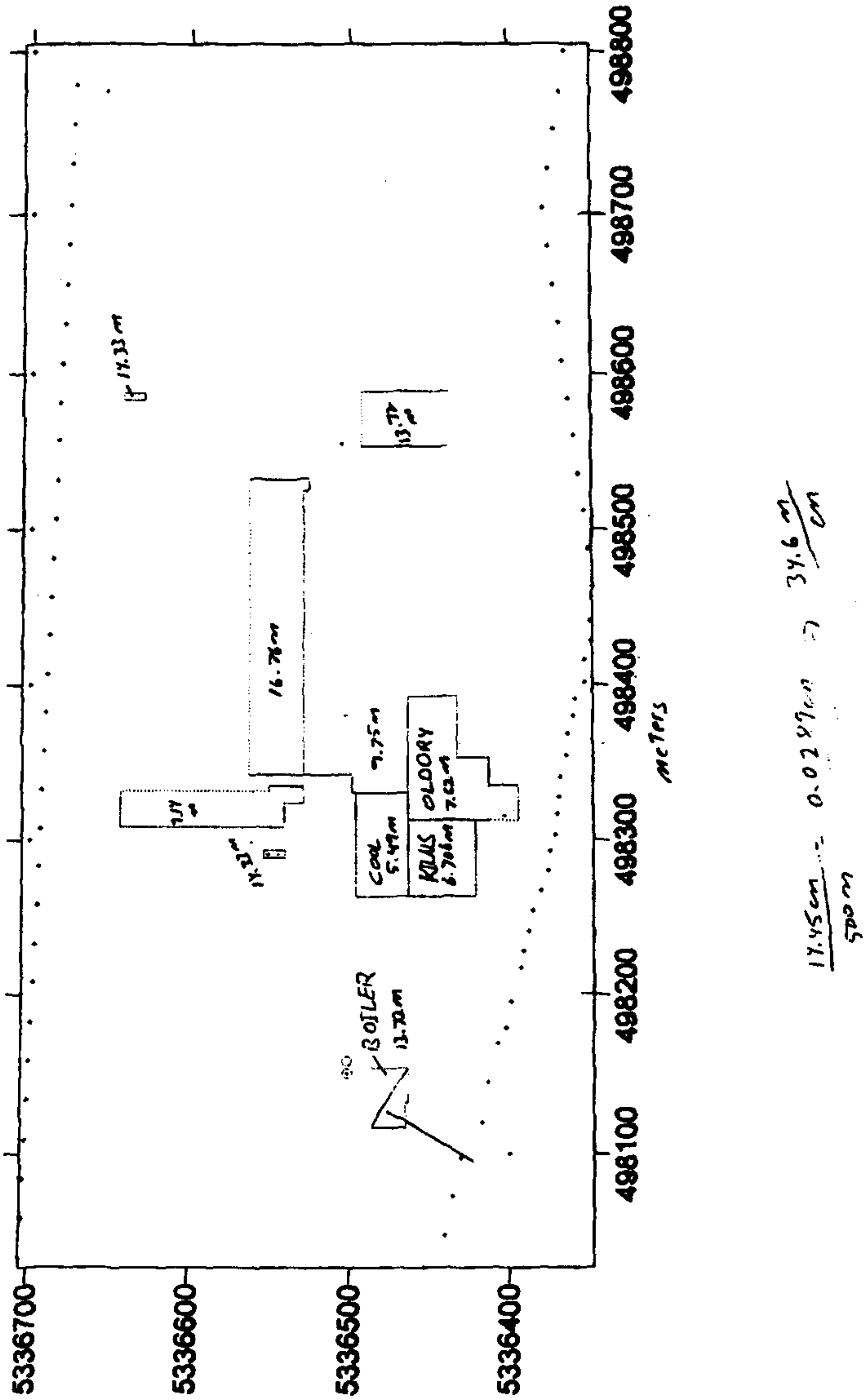
approx. distance to boundary = 1.5 cm (34.6 m/cm) = 51.9 m

Distance to fenceline is greater than cavity length, thus use of ISCST3 is adequate for downwash.

Cavity Assessment Boiler building

building height 13.72 m
max. projected width = 1.3 cm (34.6 m/cm) = 45 m
min projected width = 0.6 cm (34.6 m/cm) = 20.8 m
stack height = 30.8 m (source = DEQ#1)
stack temp = 293 K
velocity = 0.001
diameter = 0.001
From SCREEN3, no cavity conc. because critical windspeed > 20 m/sec for plume to be caught by building cavity.

10-01-01


498100
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498300
498400
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498600
498700
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5336500
5336600
5336700
meters
BOILER
13.72m
COOL
5.49m
KILNS
6.70m
OLDDRY
7.62m
16.76m
9.75m
14.33m

02/22/03
19:54:35

```
***  SCREEN3 MODEL RUN  ***
*** VERSION DATED 95250 ***

downwash boiler bldg

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE              =       POINT
   EMISSION RATE (G/S)      =      1.00000
   STACK HEIGHT (M)         =      30.8000
   STK INSIDE DIAM (M)      =        .0010
   STK EXIT VELOCITY (M/S)=          .0010
   STK GAS EXIT TEMP (K)    =     293.0000
   AMBIENT AIR TEMP (K)     =     293.0000
   RECEPTOR HEIGHT (M)      =        .0000
   URBAN/RURAL OPTION       =        RURAL
   BUILDING HEIGHT (M)      =      13.7200
   MIN HORIZ BLDG DIM (M)   =      20.8000
   MAX HORIZ BLDG DIM (M)   =      45.0000

BUOY. FLUX =     .000 M**4/S**3;  MOM. FLUX =      .000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

   DIST     CONC              U10M   USTK  MIX HT   PLUME   SIGMA   SIGMA
   (M)    (UG/M**3)   STAB   (M/S)  (M/S)    (M)    HT (M)   Y (M)   Z (M)  DWASH
 -------  ----------  ----   -----  -----  ------  ------  ------  ------  -----
     1.     .0000       0      .0     .0      .0     .00     .00     .00    NA
   100.    234.7        6     1.0    1.5 10000.0   30.80    4.07   13.55    HS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND     1. M:
   138.    330.5        6     1.0    1.5 10000.0   30.80    5.52   16.48    HS

 DWASH=    MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** CAVITY CALCULATION - 1 ***         *** CAVITY CALCULATION - 2 ***
  CONC (UG/M**3)        =    .0000       CONC (UG/M**3)        =    .0000
  CRIT WS @10M (M/S)    =    99.99       CRIT WS @10M (M/S)    =    99.99
  CRIT WS @ HS (M/S)    =    99.99       CRIT WS @ HS (M/S)    =    99.99
  DILUTION WS (M/S)     =    99.99       DILUTION WS (M/S)     =    99.99
  CAVITY HT (M)         =    16.78       CAVITY HT (M)         =    14.03
  CAVITY LENGTH (M)     =    39.84       CAVITY LENGTH (M)     =    26.40
  ALONGWIND DIM (M)     =    20.80       ALONGWIND DIM (M)     =    45.00

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S.   CONC SET = 0.0

    ***************************************
    *** SUMMARY OF SCREEN MODEL RESULTS ***
    ***************************************

 CALCULATION        MAX CONC     DIST TO   TERRAIN
  PROCEDURE        (UG/M**3)     MAX (M)    HT (M)
 --------------   -----------   -------   -------
SIMPLE TERRAIN      330.5          138.        0.

***************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
***************************************************
```

```
                                        02/22/03
                                        19:34:37
 *** SCREEN3 MODEL RUN ***
 *** VERSION DATED 96250 ***
downwash kilns bldg

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE            =        POINT
   EMISSION RATE (G/S)    =      1.00000
   STACK HEIGHT (M)       =       6.7060
   STK INSIDE DIAM (M)    =        .0010
   STK EXIT VELOCITY (M/S)=        .0010
   STK GAS EXIT TEMP (K)  =     294.0000
   AMBIENT AIR TEMP (K)   =     293.0000
   RECEPTOR HEIGHT (M)    =        .0000
   URBAN/RURAL OPTION     =        RURAL
   BUILDING HEIGHT (M)    =       6.7060
   MIN HORIZ BLDG DIM (M) =      68.2000
   MAX HORIZ BLDG DIM (M) =     131.5000

BUOY. FLUX =     .000 M**4/S**3;  MOM. FLUX =     .000 M**4/S**2.

*** FULL METEOROLOGY ***
**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************
*** TERRAIN HEIGHT OF   0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

 DIST     CONC          U10M  USTK  MIX HT   PLUME  SIGMA  SIGMA
  (M)   (UG/M**3)  STAB  (M/S) (M/S)   (M)   HT (M)  Y (M)  Z (M)  DWASH
 -----  ---------  ----  ----- -----  ------  ------ ------ ------ -----
    1.  .0000       0    .0    .0     .0     .00    .00    .00   NA
  100.  3966.       6    1.0   1.0 10000.0   6.71   6.88   6.46   SS
MAXIMUM 1-HR CONCENTRATION AT OR BEYOND    1. M:
   21.  .1029E+06   4    1.0   1.0  320.0    6.71   2.47   4.82   SS

 DWASH=   MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** CAVITY CALCULATION - 1 ***      *** CAVITY CALCULATION - 2 ***
  CONC (UG/M**3)     =   758.0        CONC (UG/M**3)     =   1437.
  CRIT WS @10M (M/S) =    1.00        CRIT WS @10M (M/S) =    1.00
  CRIT WS @ HS (M/S) =    1.00        CRIT WS @ HS (M/S) =    1.00
  DILUTION WS (M/S)  =    1.00        DILUTION WS (M/S)  =    1.00
  CAVITY HT (M)      =    6.71        CAVITY HT (M)      =    6.71
  CAVITY LENGTH (M)  =   38.98        CAVITY LENGTH (M)  =   33.83
  ALONGWIND DIM (M)  =   68.20        ALONGWIND DIM (M)  =  131.50

    ***************************************
    *** SUMMARY OF SCREEN MODEL RESULTS ***
    ***************************************

 CALCULATION         MAX CONC     DIST TO   TERRAIN
  PROCEDURE         (UG/M**3)     MAX (M)    HT (M)
 --------------     ---------     -------   -------
SIMPLE TERRAIN      .1029E+06       21.        0.
BLDG. CAVITY-1      758.0           39.       --  (DIST = CAVITY LENGTH)
BLDG. CAVITY-2      1437.           34.       --  (DIST = CAVITY LENGTH)

***************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
***************************************************
```